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SELF FERTILIZATION IN THE AIR-BREATHING POND SNAILS.

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The author has already shown that under certain conditions self fertilization is possible in the common pond snail *Lymnæa columella* Say.¹ In this paper he wishes to point out that it is common in species representing most of the important genera of the order Basommatophora, the order which includes the air-breathing pond snails.

The criteria on which self fertilization in *Lymnæa columella* has been determined is as follows: (1) The snails are hermaphroditic and eggs and sperm are ripe in the ovotestis at the same time, (2) self fertilization is mechanically possible and self copulation has been observed, (3) two polar bodies are found on the eggs produced by snails isolated from their fellows from the time of hatching, (4) normal parthenogenesis is unknown in the Mollusca. The chances therefore that the phenomena observed is parthenogenesis and not self fertilization is very nearly nil.

In every case the following method was used. A snail was isolated and placed in a jar holding from 300 to 500 c.c. of filtered pond water. A pinch of dry garden soil was added² together with a dry leaf or two from a Carolina poplar tree for food. When the snail laid eggs and these hatched, each young one, when a day or two old, was isolated and placed in a jar under the conditions stated above. If these young snails grew to adult size and laid eggs which in their turn developed, then self fertilization was assumed.

The material used was *Lymnæa columella* from around Philadelphia, *Lymnæa columella* from Chicago, *Lymnæa humilis modicella* Say, from Philadelphia ponds, *Lymnæa catascopium* Say, from the Delaware River near Torresdale, Pa., *Lymnæa*

¹ Colton, Proc. Acad. Nat. Sci. Phila., May, 1902.

² Colton, Proc. Acad. Nat. Sci. Phila., July, 1908.

reflexa Say, from Chicago, *Lymnæa auricularia* Linne, from a pond near Oak Lane, Philadelphia, *Physa heterostrophæ* Say, from Philadelphia, *Planorbis exacutis* Say, from Philadelphia, *Planorbis parvus*, Say, from Philadelphia, and *Ancylus fluviatilis* from the same place. In every case isolated snails laid fertile eggs.¹

That self fertilization is not normal when a number of snails are together in an aquarium may be inferred from the fact that one so often observes two snails in copulation. The author has even observed different species in copulation, *Lymnæa columella* and *Lymnæa humilis modicella*. In the case observed the mass of sperm that had been injected into the vagina of the snail acting as the female was soon expelled into the water where it fell to the bottom as a mass of whitish mucus. When this was examined under the microscope it was seen to contain spermatozoa. All attempts at crossing species proved failures.

The significance of the fact that self fertilization is possible in the air-breathing pond snails is that pure lines can be established in this group of animals in the same sense as in plants. That continued inbreeding of this closest sort does not cause the strain to become weak and finally extinct is proved by the fact that the author has one line of *Lymnæa columella* which has passed through thirty one self-fertilized generations.

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